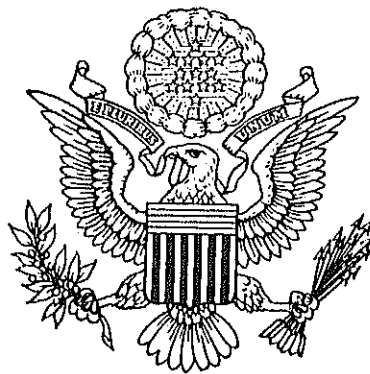


STOCKPILE REPORT

to the Congress



JANUARY - JUNE 1956

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF DEFENSE MOBILIZATION
WASHINGTON 25, D. C.

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OFFICE OF DEFENSE MOBILIZATION
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OFFICE OF THE DIRECTOR

September, 1956


The Honorable
The President of the Senate

The Honorable
The Speaker of the House of Representatives

Sirs:

There is presented herewith the semi-annual Report to the Congress on the Stockpiling Program in accordance with Section 4 of the Strategic and Critical Materials Stock Piling Act, Public Law 520, 79th Congress. This report covers the period from January 1 to June 30, 1956.

Sincerely yours,

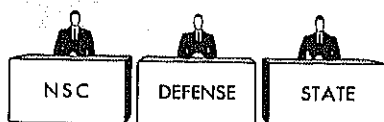

Arthur S. Flemming
Director

STOCKPILING

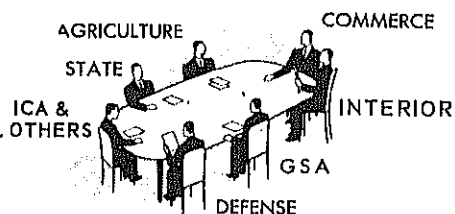
\$10,900,000,000



STRATEGIC
FACTORS



SUPPLY-DEMAND DATA
PROGRAM



OFFICE OF DEFENSE MOBILIZATION

1. Establishes Defense Materials Policies and Programs
2. Determines Stockpile Materials
3. Sets Stockpile Objectives
4. Determines Purchase Programs



OPERATIONS

GENERAL SERVICES ADMINISTRATION

EMERGENCY PROCUREMENT SERVICE

BUYS OR ACQUIRES AND STORES STOCKPILE MATERIALS FROM:

GOVERNMENT SOURCES

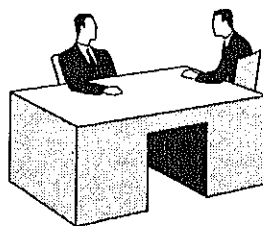
SUCH AS:

DEFENSE PRODUCTION ACT INVENTORIES

GOVERNMENT OWNED SURPLUSES

COMMODITY CREDIT CORPORATION

BARTER FOR AGRICULTURAL SURPLUSES



U. S. PRODUCERS AND IMPORTERS



INVENTORIES

OBJECTIVES

\$ 10.9 Billion, including

\$ 6.4 Billion minimum

ON HAND

\$ 5,900,000,000

24,000,000 Tons

6/30/56

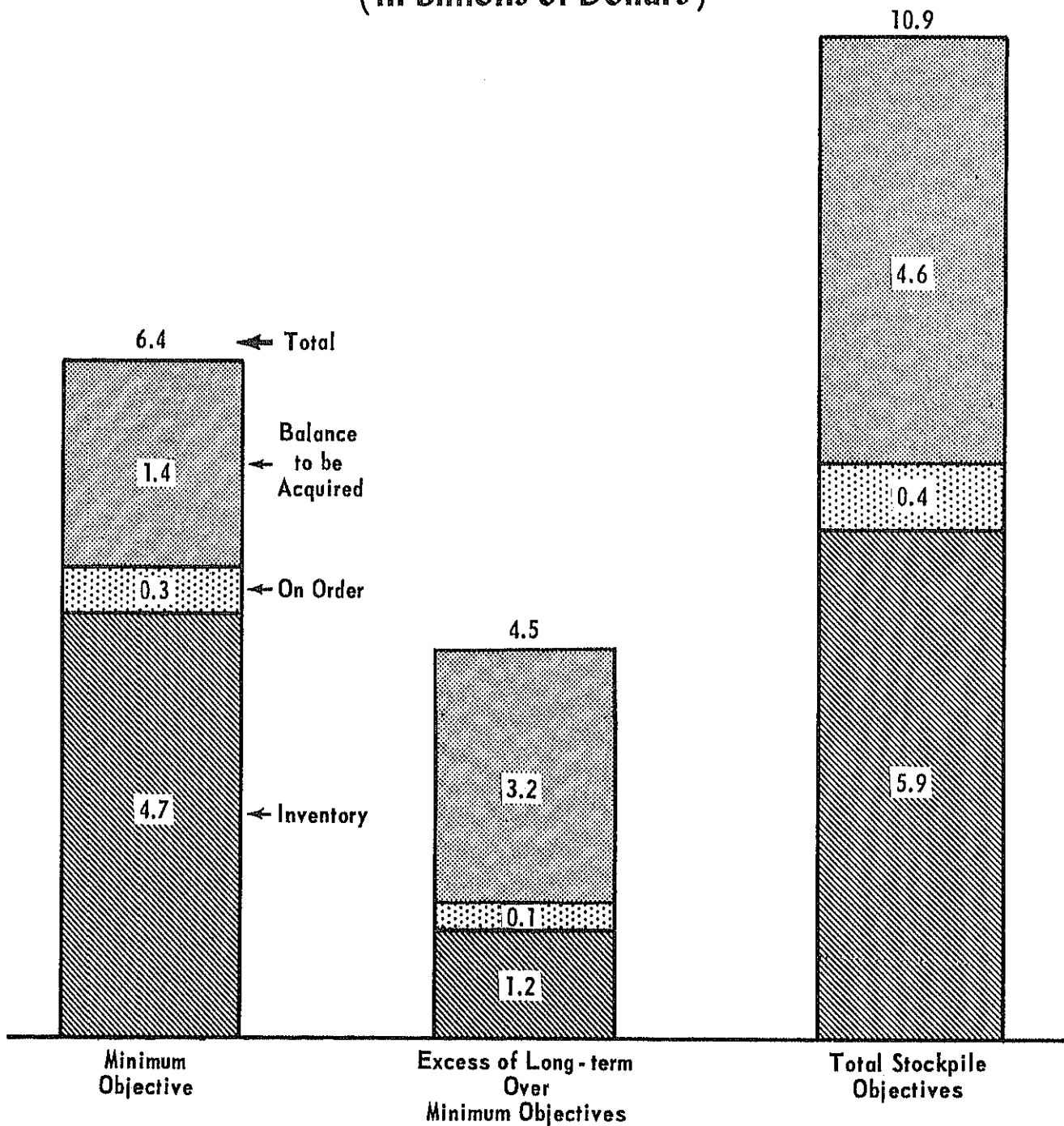
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Chart I

STOCKPILE STATUS

(In Billions of Dollars)



f materials on hand or on order under Stock Piling Act

Levels or objectives and values based on market prices as of June 30, 1956

Summary

1. This *Stockpile Report* covers the period from January 1 to June 30, 1956. It marks the completion of ten years' operations under the Strategic and Critical Materials Stock Piling Act.

2. About 24,000,000 tons of stockpile materials valued at about \$6 billion according to June 30 prices are stored in the strategic stockpile at 242 sites. Inventories valued at \$4.7 billion apply toward minimum objectives.

3. During the six months covered by this report over 600,000 tons valued at \$145,000,000 were added to stockpile inventories. Of this total \$93,500,000 were credited toward minimum objectives and \$51,500,000 toward additions for the long-term objectives.

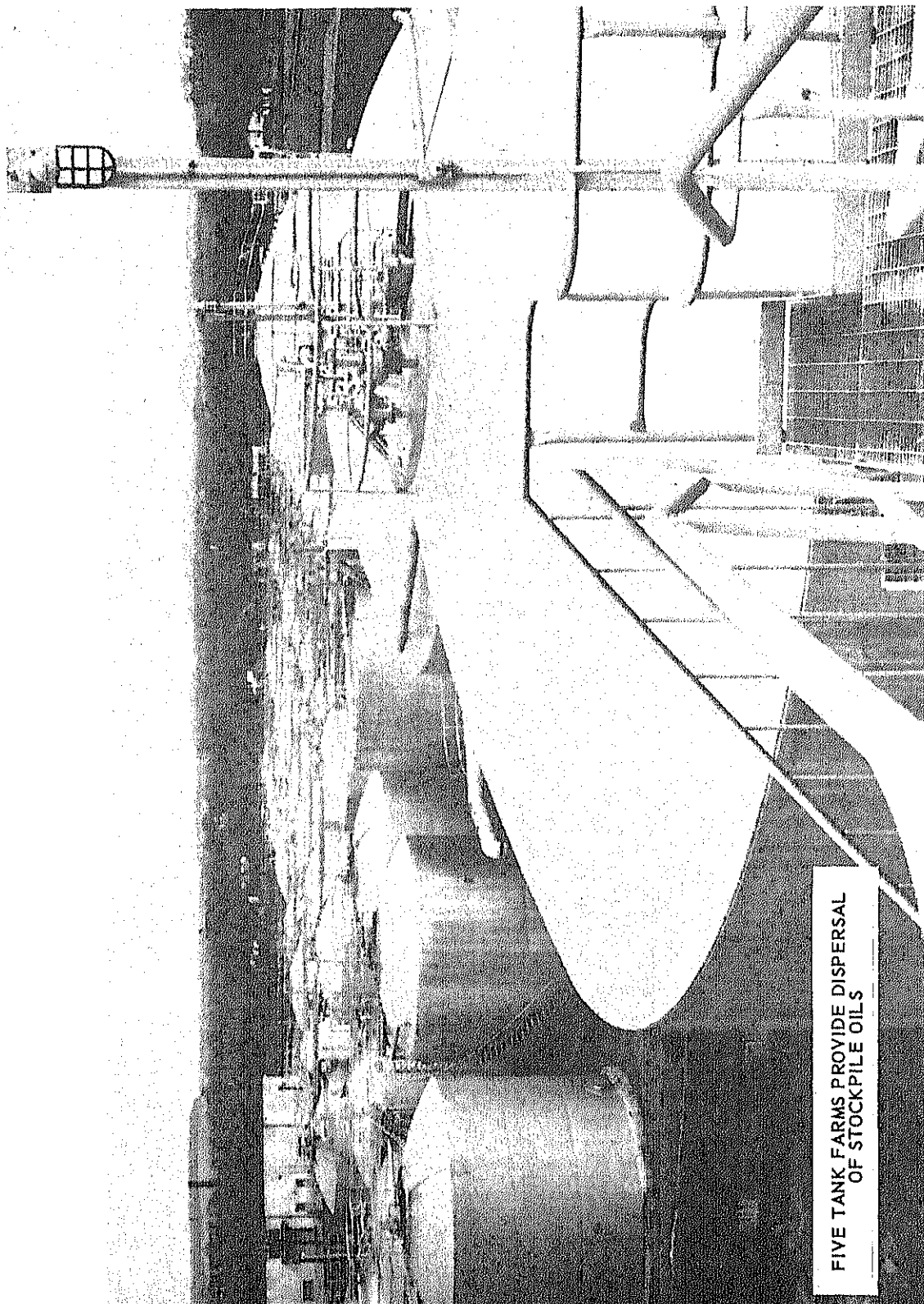
4. Inventories fill minimum objectives for 44 of the 74 stockpile materials, and the long-term objectives for 11 of these materials. These totals include 7 more materials toward minimum objectives and 4 more toward the long-term objectives during the six months.

5. New purchases during these six months totaled \$98,600,000 of which \$41,200,000 were toward minimum objectives and an additional \$57,400,000 toward the long-term totals.

6. To keep the stockpile current with changing military and industrial uses of materials and supply trends, 26 reviews of objectives for major materials were completed and another 20 were under way.

7. Barter of surplus agricultural commodities for strategic materials currently represents the largest single Government source of strategic materials. Commodity Credit Corporation inventories of strategic and critical materials totaled \$162,000,000 and the Corporation had outstanding orders for an additional \$330,000,000 worth of materials.

8. Research, development and expansion activities continued to support and supplement the stockpile program.



FIVE TANK FARMS PROVIDE DISPERSAL
OF STOCKPILE OILS

CURRENT STOCKPILING ACTIVITIES

STATUS ON JUNE 30, 1956

Ten years ago the United States determined to reduce its dependence on uncertain supplies of strategic and critical materials for periods of emergency. In the intervening years, the Government has made marked progress toward this goal as minimum stockpile objectives for 44 of the 74 stockpile materials have been filled. In addition, several other materials are no longer stockpiled, since adequate substitutes have been developed. Stockpile inventories, totaling about 24,000,000 tons, were valued at about \$6 billion at June 30 prices. During the six month period over 600,000 tons, delivered into stockpile inventories, had a value of \$145,000,000. On June 30, about \$400,-

000,000 worth of materials were on order for stockpile account.

A summary of deliveries and purchases is shown in Table I below:

Reversing the record of the past, more materials were purchased during these six months under the long-term stockpile program than toward the minimum objectives. Principal materials purchased toward the minimum objectives were metallurgical chromite, cobalt, phlogopite mica splittings, nickel, palladium and silicon carbide. Acquisitions beyond the minimum objectives but within the long-term objectives totaled about \$60,000,000 of which market purchases were about \$49,000,000, primarily lead, zinc and tin.

Table 1.—Strategic Stockpile Purchases and Deliveries by Source During January-June 1956
[Millions of Dollars]

Source	Toward minimum objectives		Additional toward long-term objectives		Total	
	Deliveries	New purchases ¹	Deliveries	New purchases ¹	Deliveries	New purchases ¹
Open market.....	\$65.7	\$12.1	\$40.5	\$48.7	\$106.2	\$60.8
DPA account.....	16.2	8.8	3.1	1.0	19.3	9.8
CCC account.....	9.2	17.9	.5	9.7	17.9
Other ²	2.4	2.4	7.7	7.7	10.1	10.1
Total.....	93.5	41.2	51.8	57.4	145.3	98.6

¹New purchases under Fiscal Year 1956 procurement program. Additional purchases of \$38,700,000 were based on earlier contracts.

²Materials acquired without cost to the Government by surplus transfer or deliveries from prior programs under authority of foreign aid legislation.

Figures supplied by General Services Administration.

BARTER TRANSACTIONS

The Commodity Credit Corporation authority to barter surplus agricultural commodities has been used to fill strategic stockpile objectives to the extent possible without interfering with programs to support the domestic production component of the mobilization base. Additional materials acquired by barter may be placed in the supplemental stockpile, which is additional to the strategic stockpile. Barter during these six months totaled \$4,000,000 for materials to be delivered toward minimum objectives, \$187,000,000 for acquisitions toward long-term objectives and \$55,000,000 for the supplemental stockpile. On June 30, 1956, inventories in Commodity Credit Corporation account for transfer to the long-term stockpile when funds are available totaled \$86,000,000, and \$76,000,000 worth of materials were held for transfer to the supplemental stockpile. Materials scheduled for future delivery against barter contracts totaled \$330,000,000.

STOCKPILE OBJECTIVE REVIEWS

During the last six months, 26 stockpile reviews of major materials were completed to adjust the stockpile, as necessary, to changing defense or industrial needs. Changes in stockpile materials and objectives occur as new potential emergency uses of materials arise, as substitutes are developed, or as supply outlook improves or deteriorates. The reviews resulted in the following changes in minimum objectives: (a) 5 materials have higher objectives, (b) 9 materials have lower objectives, (c) palladium was added to the List of Strategic and Critical Materials for Stockpiling, (shown in Appendix B) (d) the three types of jewel bearings were combined into a single objective and (e) the sapphire and ruby item was transferred from Group I to Group II of the List. At present, approximately 20 additional reviews are under way.

COMPLETED STOCKPILE OBJECTIVES

Inventories are reported to meet minimum stockpile objectives for 44 materials, an increase of seven during these six months. Four materials were added to the list of filled long-term objectives, bringing this total to eleven. Tables 2 and 3 list these materials. These lists are subject to change depending on the size of the stockpile inventories and the results of reviews of the quantity and quality requirements of the stockpile.

Table 2.—Certain Materials Where the Minimum Objective Is in the Stockpile Inventory

Abrasives, Crude Aluminum Oxide	Manganese, Battery Grade, Natural Ore
Agar	Manganese, Metallurgical Grade
Aluminum	Mercury
Asbestos, Chrysotile	Mica, Muscovite Splittings
Asbestos, Crocidolite	Palm Oil
Bauxite, Metal Grade, Surinam Type	Platinum Group Metals, Iridium*
Beryl*	Platinum Group Metals, Platinum*
Bismuth*	Pyrethrum
Cadmium	Quartz Crystals
Castor Oil	Quinidine
Coconut Oil	Rare Earths
Columbite	Rubber, Natural
Cordage Fibers, Abaca	Silk, Raw*
Cordage Fibers, Sisal	Silk Waste and Noils*
Cotton, Extra Long Staple	Sperm Oil
Diamonds, Industrial Stones	Tantalite
Graphite, Ceylon—Crystalline and Amorphous*	Tin
Graphite, Madagascar—Crystalline Flake and Fines	Tungsten
Graphite, Other Than Ceylon & Madagascar—Crystalline	Vanadium
Hyoscine	Vegetable Tannin, Chestnut
Lead	Vegetable Tannin, Quebracho
	Vegetable Tannin, Wattle
	Zinc

*Addition to list previously reported.

Table 3.—Certain Materials Where the Long-Term Objective¹ Is in the Stockpile Inventory

Abrasives, Crude Aluminum Oxide	Mercury*
Asbestos, Crocidolite	Platinum Group Metals, Iridium*
Graphite, Madagascar—Crystalline Flake and Fines	Platinum Group Metals, Platinum*
Graphite, Other Than Ceylon & Madagascar—Crystalline	Rare Earths
Manganese, Battery Grade, Natural Ore*	Tantalite
	Vanadium

¹Long-term objectives provide additional materials security for metals and minerals by setting objectives at quantities large enough to eliminate reliance in wartime on distant sources of supply.

*Addition to list previously reported.

STORAGE AND MAINTENANCE

As of June 30, 1956, stockpile materials were stored at 242 locations, as follows:

65	Military depots
15	General Services Administration warehouses
7	Other Government-owned sites (in- cluding 3 vaults)
36	Industrial plant sites
10	Leased commercial sites (in- cluding 2 vaults)
100	Commercial warehouses
6	Commercial tank facilities
3	Port storage sites
<hr/>	
242	total

Approximately 23,000,000 square feet of warehouse space, 58,000,000 square feet of open space, and 2,000,000 barrels of tank space are utilized at these 242 locations. During January-June 1956 over 1,000,000 tons of strategic materials were received and stored by the General Services Administration at these locations. About 65% of this tonnage was added to the strategic stockpile inventories, 20% to the Commodity Credit Corporation inventories and 15% to Defense Production Act inventories.

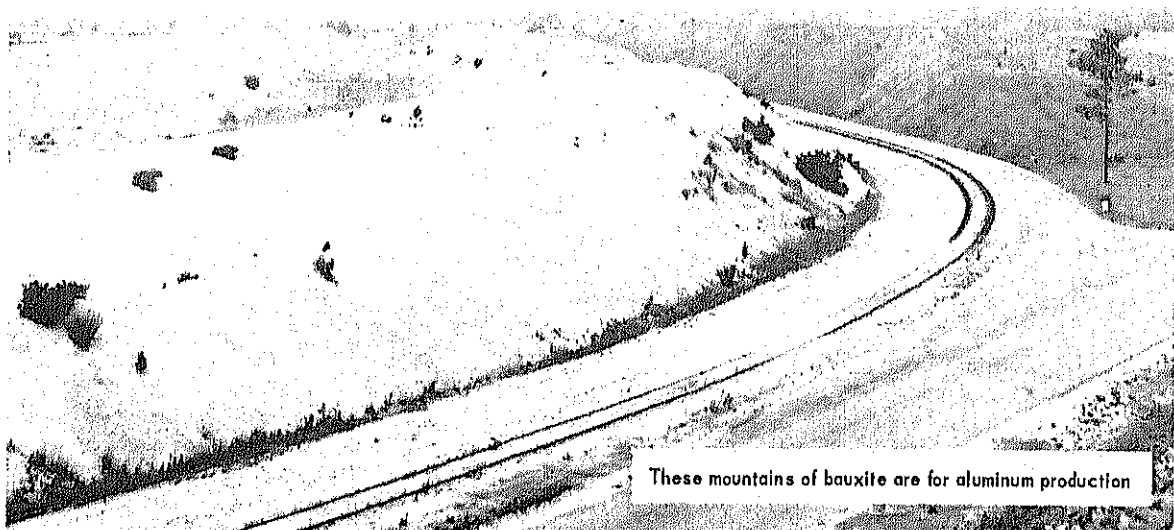
During the period, 26,000 tons of combustible materials in the stockpile inventory was removed from commercial warehouses into Government installations or for sale under the rotation programs.

Methods were developed for the restorage of materials in connection with taking physical inventories of the stockpile. During the period a physical inventory of cotton stockpiled in commercial cotton warehouses in the South was completed, and inventories were taken of other materials at certain storage locations.

RESEARCH, DEVELOPMENT AND EXPLORATION

Significant activities in research and development in strategic and critical materials during the six months are reported in Part III which deals with developments in specific materials. Although many research and development activities are currently under way, this Report covers major accomplishments only.

The Defense Minerals Exploration Administration has continued its programs of advancing funds to pay part of the cost of the exploration and development of prospective minerals deposits. As of June 30, 1956, \$26,179,000 has been obligated under 911 contracts. Thus far 290 have found ore; 246 of these have been certified as discoveries, and the remainder are pending. The estimated value of the ore covered by the certifications is about \$275,000,000. To date, ore valued at \$26,948,000 has been marketed and \$1,347,000 in Government advances has been repaid. Some 30 materials are involved in these discoveries. Selenium was added to the list of materials eligible for exploration assistance.



These mountains of bauxite are for aluminum production

REVIEW OF TEN YEARS OF STOCKPILING

The difficulties with strategic materials experienced in World War II led the 79th Congress to pass the Strategic and Critical Materials Stock Piling Act in 1946. This legislation was dedicated to stockpiling in order to "... decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations for supplies of (strategic and critical) materials in times of national emergency."

In the intervening ten years the stockpile program has advanced rapidly toward fulfillment. At the same time, changing military requirements and to some extent the rapid expansion of our national economy have required a considerable expansion of the stockpile objectives. The original stockpile targets represented a total value of about \$2 billion, while current minimum stockpile objectives are valued at about \$6.4 billion. This increase is due partly to increases in the number and quantities of materials to be stockpiled and partly to increased prices. During these ten years the stockpile program has been adjusted and adapted to harmonize with other Governmental programs and policies and to integrate it into the total defense program of this nation.

LAUNCHING THE STOCKPILE PROGRAM

Inheritance from World War II

The stockpiling of strategic and critical materials had a precedent in World War II experience. Shortly after Hitler marched on Poland in the late summer of 1939, the 76th Congress passed the Strategic Materials Act of 1939 which authorized the expenditure of \$100,000,000 to stockpile against deficiencies of certain strategic and critical materials. This program moved forward slowly until the middle of 1941. By the time of Pearl Harbor on December 7, 1941, however, approximately \$54,000,000 worth of materials had been purchased.

Some of these materials were used during World War II. However, in the case of many other materials, great efforts had to be made to increase domestic production. A large expansion of aluminum and copper production was metched by the creation of the synthetic rubber industry, and by marked expansion of aviation gasoline and other industries, which enabled the United States to remain throughout the war the "Arsenal of Democracy" by providing the material supplies essential for victory.

By the time the war had ended, the lesson of risks and costs inherent in materials shortages had been thoroughly learned and the Stock Piling Act was a natural sequel. A small staff in the Army-Navy Munitions Board and the Procurement Division of the Treasury Department continued to work on stockpiling during the first postwar year. This staff was concerned with the administration of stockpiles remaining from World War II and policies relative to the disposal of surpluses of some strategic and critical materials. With the passage of the Stock Piling Act on July 23, 1946, the program developed rapidly.

Selecting Stockpile Materials

The first task was to determine the standards for establishing a stockpile. A material is selected for stockpiling only after it has been clearly indicated by an exhaustive review that the material is essential for mobilization, that a serious wartime deficit between supply and requirements would exist and that stockpiling is the most practical and efficient means of meeting the deficit. The projected deficit is identified by means of a detailed balance sheet analysis of probable wartime requirements and supplies. Through the years only about 75 materials have been on the stockpile list at any one time, but approximately 200 have been reviewed. A few of these have been stockpiled for a brief time and then removed from the list because of a change in the potential wartime supply or requirements, including the development of substitute or alternate materials.

The direct military requirements used in these calculations are estimated by the military establishment from planned production schedules for military equipment and supplies. War-supporting and essential civilian requirements are estimated by the civilian agencies, chiefly the Departments of Commerce and Agriculture, in accordance with planning guides and criteria provided by the Office of Defense Mobilization. These estimated requirements are scrutinized and adjusted, if necessary, to accord with industrial capacity to consume the materials, and may be further adjusted to allow for economical wartime substitutes, conservation and technological changes in materials usage.

The supply estimates are based on expected wartime domestic production and imports, and are adjusted for expected expansion projects, depletion of deposits, vulnerability of production facilities, and possible losses or interruptions of production or shipments. The effect of possible foreign losses or interruptions is provided for by applying strategic discount factors developed in accordance with guidance provided by the Joint Chiefs of Staff and the Department of State.

Much of the work of assembling and analyzing the basic data used in calculating minimum stockpile objectives is performed by seven interdepartmental commodity committees created by the Office of Defense Mobilization for this purpose. Proposed objectives are reviewed by the Interdepartmental Materials Advisory Committee and, if major policy issues arise, they may be referred to the Defense Mobilization Board, or possibly the National Security Council. Stockpile objectives are then established by the Office of Defense Mobilization. The procedure is essentially the same when a new material is added to the stockpile list or an existing objective is reviewed.

Stockpile Administration

During these ten years, stockpile administration has been adjusted as new agencies have been created and new activities undertaken. The National Security Act of 1947 created several agencies affecting stockpiling: the National Security Resources Board, the Department of Defense, the Munitions Board, and the National Security Council. The Office of Defense Mobilization has succeeded the Munitions Board as the agency

having primary responsibility for stockpile policy, while other changes in Governmental organization and responsibility have occurred to correlate stockpiling with other Governmental activities. At first the Treasury Department was responsible for purchasing and custody of stockpiles; however, this work is now handled by the General Services Administration.

Since achievement of the stockpile program is essential to materials security, it is Government policy that minimum stockpile objectives should be completed rapidly at the lowest possible cost without creating undue hardship in the civilian economy and without interfering with defense production. The rate at which the long-term objectives will be met is determined in accordance with standards discussed later. Stockpile procurement endeavors to make a maximum contribution to the maintenance of domestic sources of supply, while at the same time keeping the United States in a position to turn to foreign sources where complete reliance on domestic supply is not possible.

The size, nature and purpose of the stockpile have required special policies, procedures and techniques for storing stockpile materials. Government policies and criteria for the storage of stockpile materials are designed to make certain that such materials will be secure and will be promptly available to essential consuming industries in time of war. Accordingly, the materials are stored and maintained so as to provide adequate protection against the risk of loss from possible enemy action and from non-military destructive factors such as contamination, deterioration, theft, sabotage, fire and adverse climatic conditions. Storage sites located close to wartime consuming facilities help insure continuity of wartime production and minimize the burden of transportation in time of war and the delays which might occur from disrupted transportation facilities. These objectives are accomplished at the lowest possible storage cost.

Under these basic policies established by the Office of Defense Mobilization, the Emergency Procurement Service selects storage facilities and provides for the transportation, inspection, maintenance and security of stockpiled materials. In selecting storage sites, preference is given to Government-owned facilities which are suitably constructed and located; however, many non-perishable materials are stored in plant areas.

Certain stockpile materials, such as the vegetable oils, cordage fibers and rubber, deteriorate with age and must be replaced periodically with fresh stocks. It is Government policy to rotate these materials before deterioration has taken place. Some cost is incurred, however, primarily because of the added transportation and handling required. Rotation programs are planned and operated by the Emergency Procurement Service after consultation with the affected industries. Rotation transactions usually consist of simultaneous sales and purchases and thus generally have little or no market impact.

Acquisitions

At its start, the stockpile program had two principal sources of materials. Approximately \$45,000,000 worth of materials which had not been used during World War II remained in stockpiles. A much greater quantity of materials, however, was acquired from surplus Government stocks. Large quantities were transferred to the stockpile by War Assets Administration and the Departments of War and Navy. The Reconstruction Finance Corporation and the Bureau of Federal Supply in the Treasury Department held some inventories which were also transferred to the stockpile. Through the operation of wartime preclusive buying activities the Government had acquired sizable quantities of certain materials which were determined to be strategic and critical and were consequently placed in the stockpile.

Although it was first planned to complete the stockpile within five years, several factors modified these plans. During this period stockpile purchases were severely restricted both to avoid interfering with reconversion of the national economy from war production to a peacetime footing and because of rising world prices. The first appropriation for the new stockpile program authorized the expenditure of \$100,000,000. In addition, the stockpile program was authorized to expend the unused balance of the \$70,000,000 which had been appropriated under the 1939 Act. The next year the appropriation provided another \$100,000,000 and \$75,000,000 for contract authorizations. During the next three years additional appropriations and authorizations for contracts increased the total available for stockpiling to \$1.5 billion. The contract authorizations permitted the Government to enter into long-term contracts which enabled

suppliers to increase their productive capacity in order to fulfill their commitments to the stockpile. This expansion of capacity not only aided in filling the stockpile but strengthened the United States supply by providing supplies additional to those otherwise available to the civilian market.

EFFECTS OF KOREAN CONFLICT ON STOCKPILING

Stockpiling plans and programs were interrupted and altered by the attack in Korea. This conflict generated a spiralling demand for basic materials brought about by expanded industrial demand for current production and the increased urgency to build up stockpiles. Even greater expansion programs for many strategic and critical materials were undertaken to enlarge supplies to meet sharply increased current military and industrial needs. Stockpiles were tapped for certain materials, while enlarged purchases were undertaken for other materials. Appropriations reflected this new emphasis upon preparedness. Moreover, the Government organization to integrate stockpile activities was substantially altered, as new agencies were created to meet the new problems.

Materials Controls

Quadrupling the military budget led inevitably to a sharp rise in direct and indirect military requirements for certain materials either in the stockpile or scheduled for stockpile purchase. To meet this demand the Government withdrew from the stockpile about \$60,000,000 worth of materials, primarily copper and aluminum. Much more important as a source for industry of badly needed materials were diversions of scheduled stockpile deliveries to meet current mobilization needs. These diversions, totaling about \$186,000,000, covered many stockpile materials.

Despite the large quantities of materials made available from stockpile programs, the shortage of many materials was so great that Government allocation orders limited their uses to only the most essential needs. Some non-essential industries were denied completely the use of scarce stockpile materials, while others were so severely limited that they were forced to develop substitutes from more readily available materials. In some instances, the development of these substitutes permitted the reduction

of stockpile objectives. For example, new textile fibers proved sufficiently effective and abundant to justify a sharp reduction in the objective for silk waste and noils.

In the list of priorities for use of available strategic and critical materials, stockpiling came third after military and war supporting industrial use. As a result, stockpile deliveries for several materials ceased until defense needs declined or expansion projects relieved the shortages.

Expansion Authority

The passage of the Defense Production Act in the summer of 1950 reflected recognition of the fact that expansion of many minerals and metals producing industries would require Government assistance. This law creates a borrowing authority fund totaling \$2.1 billion and authorizes loans, loan guarantees, long-term purchase contracts, market guarantees and similar incentives to help finance and support new defense supporting industries.

Under this authority expansion programs for 25 stockpile materials are in effect with a gross value of about \$6.9 billion and a probable ultimate net cost to the Government of about \$800,000,000. This net cost figure is the estimated net loss to the Government on materials, which may be delivered to the Government under these contracts, for which the price paid may exceed market prices or which may be in excess of market or stockpile demand. If as time passes industrial demand increases or prices rise, the estimated loss declines. For example, the aluminum expansion program, which involves a gross transaction figure exceeding \$1.5 billion, now is estimated to involve practically no further loss because of the increase in aluminum demand and prices since the expansion was assisted. Some loss was incurred earlier through the operation of high cost plants which required a premium price.

Rapid tax amortization, also authorized in 1950, proved perhaps the most important form of Government financial assistance for expansion. Under the stimulus of this incentive many industries undertook projects to expand production of strategic and critical materials.

Appropriations

In addition to the expansion activities, the Congress authorized increased appropri-

ations for the stockpile during the Korean conflict. During the month of September 1950 two appropriation acts provided over \$1.2 billions and the following January another \$1.8 billion was appropriated. Another billion dollars was appropriated by July 1952. These funds permitted greatly expanded procurement of many of the stockpile materials. For some materials, the stockpile program entered into long-term purchase contracts which would permit expansion of capacity. Some of these stockpile contracts, now at favorable prices to the Government, are still in existence and deliveries are being made against them. However, by the end of 1953 it was decided that long-term, expansion type contracts would be negotiated only through use of the borrowing authority, and that stockpile contracts would be limited largely to deliveries which could be accomplished within the fiscal year following the contract.

Toward the end of the Korean emergency stockpile deliveries increased rapidly to approximately \$900,000,000 for fiscal year 1953. It was possible to report by June 30, 1953, consequently, that 35 stockpile objectives were covered by materials on hand and on order.

Stockpile Administration

To administer the Korean emergency agencies and to guide and coordinate civilian mobilization activities, the President created the Office of Defense Mobilization in December 1950. In January 1951 he established the Defense Production Administration, to operate within policy guidance provided by the Office of Defense Mobilization, to coordinate production controls with requirements and supplies and to allocate resources to meet the most essential needs. These and several other new agencies possessed authority and responsibilities which transcended those for stockpile operations previously held by the Munitions Board, the National Security Resources Board and the General Services Administration. During much of the Korean emergency period these agencies adjusted their stockpiling interests and activities through the operation of inter-agency committees for stockpile procurement and policy. In June 1953, in accordance with Reorganization Plan No. 3, the responsibilities of these agencies for stockpile policy and coordination were assigned to the Office of Defense Mobilization.

STOCKPILE OPERATIONS AFTER KOREA

Following the cessation of hostilities in Korea, several important developments affected the stockpiling program. Availabilities of certain materials improved to the point where supply began to exceed industrial demand. For some other materials shortages continued because of large military requirements and a high level of industrial demand. In addition the mounting problem of surplus agricultural commodities led to increased emphasis on exchanging these surpluses for metals and minerals for the stockpile. Finally, stockpile storage policies were adjusted to minimize risks of potential damage from a nuclear attack.

Long-Term Stockpile

Reexamination of the policies for determining stockpile objectives indicated the need for some additional protection against wartime risks. Recognizing this situation the President in 1954 announced a long-term stockpile program for metals and minerals. This long-term stockpile is designed principally to provide additional materials security by setting long-term objectives at quantities large enough to eliminate any reliance in wartime on potentially inaccessible foreign sources which may be included in calculating minimum objectives. Policies governing materials acquisition beyond the minimum objectives have been established by the Office of Defense Mobilization on the basis of principles contained in the "Report of the President's Cabinet Committee on Minerals Policy" issued in November 1954.

These policies provide for filling the long-term increment above the minimum objectives by: (1) purchase of newly mined domestic metals and minerals under those special circumstances which require support of the domestic production component of the mobilization base, (2) transfer of materials held in Government inventories, such as the Commodity Credit Corporation and Defense Production Act accounts and (3) transfer of surplus Government inventories which would otherwise be subject to disposal. These policies are designed to integrate stockpiling more thoroughly into the Government's defense materials programs. Purchases are made only at prices favorable to the Government. Progress on the long-term increment has a distinctly lower degree of urgency than the filling of the minimum objectives.

These purchasing policies have helped the domestic production component of the mobilization base for certain strategic and critical materials.

Stockpiling and Agricultural Surpluses

Passage in 1954 of the Agricultural Trade Development and Assistance Act emphasized anew the determination of the Government to move its holdings of surplus agricultural commodities. Wherever possible, consistent with the policy of supporting the domestic component of the mobilization base, barter has taken the place of other means of filling the stockpile. Accordingly, market purchases for cash for the stockpile have been sharply reduced. Among other things, this Act authorized barter of these perishable surpluses for nonperishable strategic materials having low storage costs and established a supplemental stockpile which was additional to the strategic stockpile. The President delegated authority to the Office of Defense Mobilization to designate the materials to be acquired for this supplemental stockpile. A 1956 amendment provides that strategic materials acquired by barter shall be placed in the supplemental stockpile, if not acquired for the strategic stockpile or other Government use.

Diversions and Deferrals

The restriction in the Stockpiling Act that stockpile purchases should not unduly interfere with the civilian economy has gained increasing importance during the post-Korean period. The steadily rising level of the national economy has required increasing supplies of many materials. Expansion, undertaken earlier to provide supplies for the stockpile, has been helpful in meeting new or greater industrial demands. Scheduled nickel stockpile deliveries have been subject to some diversion throughout this period in order to meet continued high military needs and to help meet a critical shortage for industrial uses. Aluminum was available in quantity for part of 1954-55, but rapidly rising industrial demands soon created a serious shortage. The copper situation became acute by the middle of 1954 because of work stoppages and later high industrial demands. Selenium supplies have been so tight that stockpile purchases have not been made. Several other stockpile materials also remain in tight supply.

These conditions have led to diversion

and deferral of scheduled stockpile deliveries. Generally upon recommendation of a delegate agency, the Office of Defense Mobilization considers the relative merits of stockpile purchases against industrial and military demand. The question is frequently referred to the Defense Mobilization Board which is composed of the Secretaries of State, Defense, the Treasury, Commerce, Agriculture, Labor and the Interior, and the heads of the International Cooperation Administration, Federal Civil Defense Administration and Board of Governors of the Federal Reserve System. After receiving the Board's advice, the Director determines the action to be taken.

The decision may be to defer or cancel deliveries by permitting producers to sell on the open market. Deferrals merely postpone to a later date scheduled deliveries to the Government. In the case of cancellation, the contract obligation of the Government to acquire a material is discharged by releasing the supplier from his scheduled deliveries. The decision to cancel may be made if it will not adversely affect our defense position or result in financial loss to the Government.

Storage Policy Changes

Knowledge that other nations possessed the ability to employ nuclear weapons on continental United States and the development of weapons equivalent to millions of tons of TNT raised the question of vulnerability of stockpile storage sites. Generally because of the dispersal of stockpile storage sites and the large bulk, or low susceptibility of many stockpile materials to destruction, there is only moderate risk of major damage to the stockpile in event of nuclear attack. Policies have been put into effect which should reduce the vulnerability of stockpiles, particularly such materials as rubber, fiber, tannins and graphite, to loss in case of massive attack on the United States. Materials in known target areas are being relocated when it is feasible to do so. Relocation can sometimes

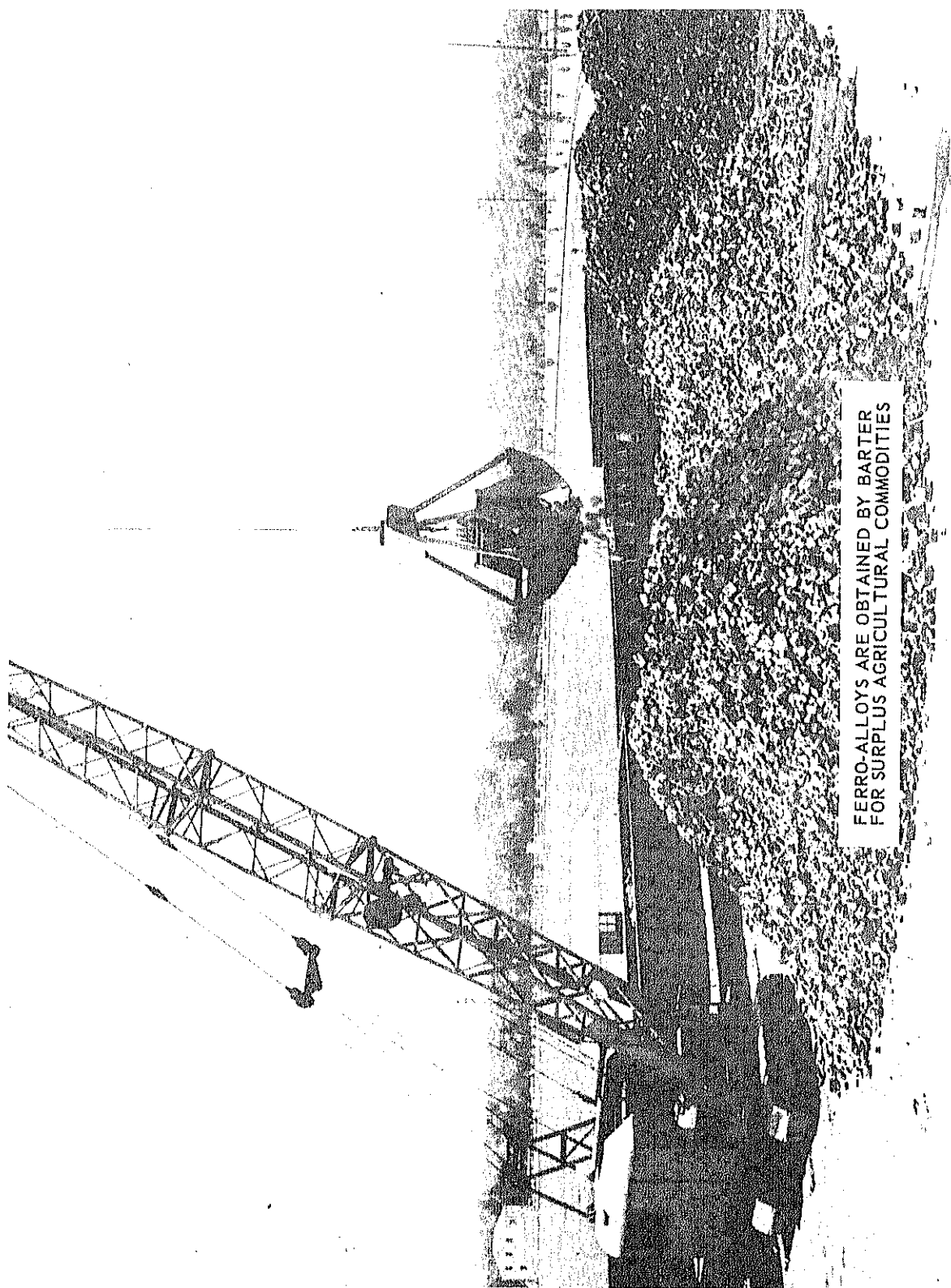
be accomplished by changing storage location in the course of rotation, thus eliminating substantial handling and transportation charges.

SUMMARY

The stockpile program, starting belatedly before World War II, grew into a major Governmental activity with the passage of the Stock Piling Act in 1946. In the ten intervening years it has grown into a bulwark against aggression by providing assurance that United States military efforts will not, in the event of full mobilization, be handicapped by shortages of strategic and critical materials.

This program has been adapted and adjusted to meet widely varying conditions. Postwar reconversion of our national economy made early completion of the stockpile unattainable. While the Korean conflict gave the stockpile program its greatest boost, the program in turn helped to eliminate materials hardships by stimulating expansion of the supplies of needed materials. Since the termination of the Korean hostilities, the stockpile program has been woven closer into the fabric of national policy. Now a major source of stockpile materials is derived from the barter of the Commodity Credit Corporation's inventories. Expansion programs undertaken earlier are helping to meet current industrial needs as well as to fill open stockpile objectives. Current emphasis is directed to the few materials which have inadequate stockpile inventories. In addition, research and development of alternative materials and expansion of supply sources are being actively employed.

Today the stockpile program can take credit for vast increases in industrial supplies, impressive technological advances, and marked progress toward defense materials security. The program is constantly under review. As necessary it is being adjusted to meet changes in the outlook for materials and in national policy.



FERRO-ALLOYS ARE OBTAINED BY BARTER
FOR SURPLUS AGRICULTURAL COMMODITIES

DEVELOPMENTS IN SPECIFIC MATERIALS

Aluminum.—Domestic consumption of aluminum reached new peaks during the first half of 1956. With the minimum stockpile objective filled, all domestic production was available for commercial purposes. During this period production capacity increased by about 100,000 tons annually as programmed expansions were completed.

The Government has scheduled no calls for delivery of metal during the last half of 1956 from new aluminum production capacity developed earlier with Government assistance. Plans by producers to expand capacity further have been proceeding rapidly. By June 30, about 650,000 tons of new primary aluminum annual capacity was being built or planned, of which more than 500,000 tons was being built without Government financial incentives.

Bauxite.—The program to stockpile Jamaica type bauxite moved rapidly toward achievement. Options under an earlier Defense Production Act contract were exercised to provide larger tonnages for delivery during the five year period covered by the contract; some deliveries were made into the stockpile under this contract. Barter contracts calling for delivery over five years will provide for filling the gap remaining toward achievement of the minimum and long-term stockpile objectives as now calculated. The five year barter contracts are designed to permit the suppliers to construct necessary mining and shipping facilities in providing the bauxite required for the stockpile. The Jamaica type bauxite will be used by some of the new aluminum facilities reported above.

Beryl.—At the end of June 1956, the stockpile inventory was in excess of the minimum objective which was recently reduced. The domestic purchase program for beryl under the Defense Production Act was extended to June 30, 1962, with a total amount to be purchased under this program of 4,500 short tons which may be placed in the long-term increment.

The Bureau of Mines of the Department of the Interior has continued its beryl research program with the aim of developing a

flotation process to produce commercial grade beryl concentrates from domestic low grade pegmatites. Low grade beryl reserves in the United States are substantial but mineral dressing techniques need to be developed before the bulk of the reserves can become competitive for industrial use.

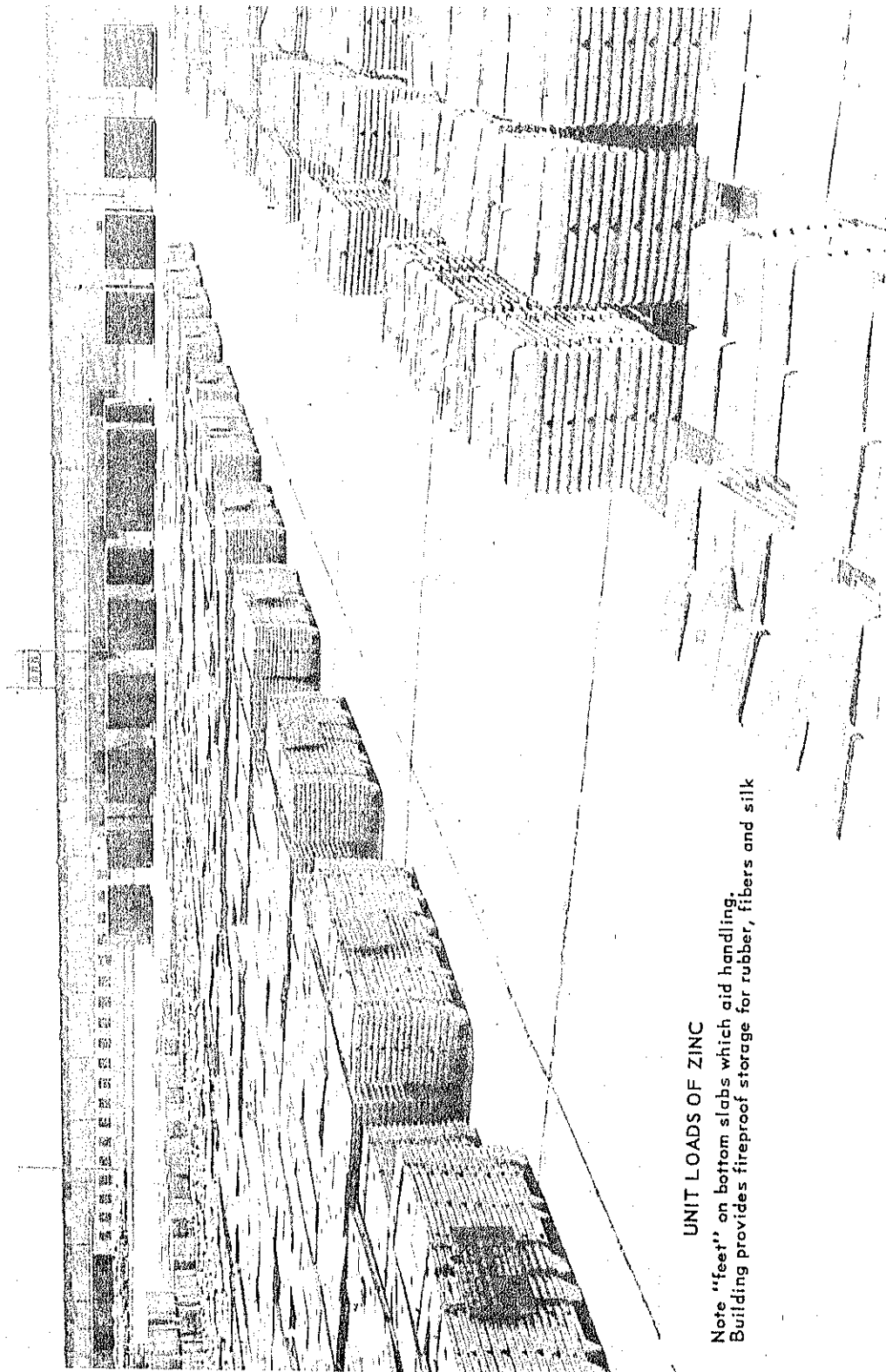
Bristles, Hog.—Following the notice for the disposal of 2,000,000 pounds of hog bristles published in the *Federal Register* on December 3, 1955, arrangements were made for the first offering to industry of approximately 500,000 pounds of surplus hog bristles.

Castor Oil.—The Department of Agriculture has continued its programs to obtain and store satisfactory varieties of castor bean seeds, to increase knowledge of growing and harvesting castor beans, and to develop adequate hulling, harvesting, and processing equipment.

Cobalt.—Exploration based on geologic mapping and geochemical sampling by the Geological Survey of the Department of the Interior has revealed new cobalt-copper ore deposits in Idaho that may constitute a major increase in our known cobalt reserves. A Defense Production Act contract was negotiated for 18,000,000 pounds of cobalt from the Belgian Congo for delivery over a three-year period.

Coconut Oil.—Rotation of coconut oil during the period reduced by about half the stock in west coast commercial storage facilities. Replacement was made with oil which was delivered into Government facilities located on the east coast. After a review of the objective, the Office of Defense Mobilization recommended a reduction in the Government stocks. An industry advisory committee was consulted concerning a proposed disposal program from the surplus.

Columbite-Tantalite.—The large deposits in Idaho, reported earlier, are being placed in commercial operation. Arrangements have been made for processing and delivery to the Defense Production Act account under an earlier development contract. Ad-



UNIT LOADS OF ZINC

Note "feet" on bottom slabs which aid handling.
Building provides fireproof storage for rubber, fibers and silk

ditional stockpile purchases are not being made because stockpile needs for both materials have been met.

Copper. --Based on the improved copper supply situation, the Government determined that the policy of deferrals of scheduled copper deliveries to stockpile or Defense Production Act account could be discontinued and that earlier deferrals could be scheduled for delivery. This decision, made in June, came after copper prices had peaked in March and then fallen back almost to the levels of late 1955. Earlier in the year about 10,000 tons previously scheduled for delivery to the Government were made available to industry to meet the heavy demands. No copper in the stockpile was released. The Department of Commerce and the General Services Administration have developed with the producers a schedule for delivery of previously deferred copper phased over about 18 months in order to avoid any undue pressures on industrial supplies.

A mine in Shasta County, California, which had been idle for the past 30 years, was reopened as a result of new discoveries made with Defense Minerals Exploration Administration assistance and based on mapping of this district by the Geological Survey.

Cotton, Extra Long Staple. --Growers of extra long staple cotton in New Mexico and western Texas during 1955 followed Arizona's lead in shifting from Pima 32 to the new American-Egyptian variety Pima S-1 to the extent that certified seed was available. In yield of lint, boll size, and lint percent Pima S-1 continues to show superiority over Pima 32 in all locations where experimental plantings have been made during the past three years. Continuing extensive tests by the spinning firms indicate that Pima S-1 is a satisfactory extra long staple cotton for their needs.

Cordage Fibers, Abaca and Sisal. --New rotation procedures for abaca and sisal were announced during the period. Arrangements were made to channel all abaca production from the Central American abaca program to the stockpile beginning July 1, 1956, to replace abaca sold to industry to rotate the inventory. The Department of Agriculture has continued research and experiments in planting and rope tests with phormium and sansevieria as possible extenders in the supply of hard fiber cordage if needed in an emergency.

Digitalis. --The Department of Agriculture has obtained from the past season's crop an inventory of digitalis seed suitable for planting in case of an emergency. The seed inventory should yield a substantial quantity of digitalis to help provide for essential needs.

Emetine. --A notice was published in the *Federal Register* on April 21, 1956, of the proposed disposal of 3,300 ounces of emetine in October 1956. Industry recommendations concerning disposal of this material were obtained at a Business and Defense Services Administration industry task group meeting.

Fluorspar. --Continued efforts by the Emergency Procurement Service to obtain offers of domestically produced metallurgical grade fluorspar resulted in contracting for only a small additional amount. Under previously executed contracts, deliveries lagged in some cases because the producers experienced difficulties in meeting stockpile specifications.

Iodine. --Some iodine has been acquired and the remainder to fill the stockpile has been contracted for through Commodity Credit Corporation barter transactions. Changes in the iodine specifications were approved to provide for more suitable packaging of iodine for long-term storage.

Manganese. --The Fiji Islands have proved to be a new and promising source of chemical grade manganese ore. For battery grade manganese ore the long-term objective is in the stockpile inventory, and the supplemental stockpile has been filled by barter of surplus agricultural commodities. The domestic purchase program for carlot quantities of specification grade domestic metallurgical manganese ore was extended to January 1, 1961, and the purchase quota increased to 28,000,000 long ton units. The premium price ore to be obtained under this program will be available for the long-term stockpile. Research in processing low grade oxides and low grade ores by Bureau of Mines laboratories shows further progress.

Mica. --The Commodity Credit Corporation has entered into barter transactions for mica. Despite some improvement in the procurement situation, muscovite block and film mica still continue to be critically needed materials for the stockpile. The domestic mica purchase program was extended to June 30, 1962. The program will terminate on this

date or earlier if the equivalent of 25,000 tons of hand-cobbed mica has been acquired.

Molybdenum.—Because of an improved defense position for molybdenum, it was found possible to defer deliveries to the stockpile in favor of industry to meet an increasing demand for exports. Similar deferrals will be made for the second half of the year. Meanwhile capacity of domestic producers in Colorado and Arizona is being increased.

Nickel.—Constantly increasing industrial demands combined with a high level of military requirements resulted in the continuance of the acute shortage of nickel despite the diversion from scheduled shipments to the Government of 34,300,000 pounds during these six months. To solve these problems the Office of Defense Mobilization announced a new nickel expansion program to increase annual availability to the United States to a total of 440,000,000 pounds. This amount is 140,000,000 pounds above the current availability and 60,000,000 pounds above the previous goal. Under this expansion program producers may receive Government assistance in the form of rapid tax amortization, long-term contracts and in certain cases premium prices.

Opium.—Seed produced in 1951 and subjected to germination tests in 1955 showed a small but consistent decrease in viability. It may be necessary within 2 or 3 years to replant a part of the stored seed or a new variety from the poppy breeding program to maintain satisfactory seed stock. The poppy seed inventory, together with the method for extracting morphine from poppy straw by the Agricultural Research Service, provides a basis for producing some of the nation's morphine requirements within a reasonable period after an emergency arises.

Palm Oil.—A notice was published in the *Federal Register* on February 3, 1956, for the disposal of an additional 20,000,000 pounds of palm oil. Sale of most of the 30,000,000 pounds which became available for disposal on December 2, 1955, has been accomplished.

Pyrethrum.—Based on the lower stockpile objective, a notice was published in the *Federal Register* on March 15, 1956, for the disposal of another 75,000 pounds of pyrethrum extract. Most of the first 60,000 pounds made available for disposal last year was sold.

Quinine.—Offers from industry for total quinine to be disposed of from the stockpile were not acceptable and all bids were rejected. Other outlets for this commodity are being explored.

Rare Earths.—The Bureau of Mines continued its research to increase the usage of rare-earth metals. These materials are now in abundant supply as a co-product with thorium from monazite and from large domestic sources of rare-earth minerals developed over the past few years.

Rubber.—The Agricultural Research Service reported some important advances in the understanding of how plant products are synthesized in nature. For the first time, test tube synthesis of natural rubber by enzymes in the absence of plant cells has been demonstrated in the laboratory. This demonstration marks a great advance in the study of the mechanism of biosynthesis of an important natural product. With guayule, the main emphasis has been on establishing more promising breeding stock for maintenance or partial testing. The program will be maintained on a standby basis for selection, improvement and maintenance of better stock.

Selenium.—Demand for selenium continued to exceed supply; as a result, prices increased sharply. The Bureau of Mines accelerated its exploration program in the western states. All deposits examined to date have proved to be either too small or too low in grade to be of commercial value. The use of alternate materials such as silicon and germanium in rectifiers is increasing and may relieve the selenium shortage eventually.

Shellac.—Due to a crop failure in India, which is the principal source of supply, no shellac was procured for the stockpile because of the adverse affects such action might have upon the market.

Sperm Oil.—More than 500,000 pounds of sperm oil stored in drums was transferred to a Government tank farm in order to avoid the replacement of defective drums. The quality of the stockpiled oil remained satisfactory during this period.

Titanium.—Further developments in use of titanium led two companies during the six months to embark on sponge expansion programs without Government assistance. These expansions amounting to about 5,400 tons

will increase total domestic annual capacity to about 28,000 tons by 1958. The price of sponge has continued to drop and by July 1, 1956, was \$3.00 per pound. On that date domestic production was at the rate of about 11,000 tons per year.

Several Government agencies continue the search for new and improved sponge production processes and for additional knowledge of fabricating and processing technology.

The Bureau of Mines is conducting studies on electro-refining binary alloys of titanium, on titanium scrap and on other titanium metals, and on smelting ilmenite to produce titanium slag suitable for production of titanium. The Department of Defense launched a titanium alloy sheet development program. Rapid tax amortization has been extended to several companies for titanium melting, fabricating and auxiliary facilities.



Each barrel of cobalt weighs about 600 pounds and is worth more than \$1200

FINANCIAL SUMMARY OF STOCKPILE OPERATIONS AS OF JUNE 30, 1956

Table 1 STATUS OF OBLIGATIONAL OPERATIONS
AS OF JUNE 30, 1956

AUTHORITY	APPROPRIATED FUNDS ^{a/}	AUTHORIZATIONS FOR		TOTAL OBLIGATIONAL AUTHORITY (CUMULATIVE) ^{d/}
		MAKING ADVANCE CONTRACTS ^{b/}	LIQUIDATING OUTSTANDING ADVANCE CONTRACTS ^{c/}	
Under PL 117 - 76th Congress				
PL 361 - 76th Congress, August 9, 1939	\$ 10,000,000			\$ 10,000,000
PL 442 - 76th Congress, March 25, 1940	12,500,000			22,500,000
PL 667 - 76th Congress, June 26, 1940	47,500,000			70,000,000 ^{e/}
Under PL 520 - 79th Congress				
PL 663 - 79th Congress, August 8, 1946	100,000,000	-	-	100,000,000
PL 271 - 80th Congress, July 30, 1947	100,000,000	75,000,000	-	275,000,000
PL 785 - 80th Congress, June 25, 1948	225,000,000	300,000,000	-	800,000,000
PL 785 - 80th Congress, June 25, 1948	75,000,000	-	75,000,000	800,000,000
PL 119 - 81st Congress, June 23, 1949	40,000,000	270,000,000	-	1,110,000,000
PL 150 - 81st Congress, June 30, 1949	275,000,000	250,000,000	-	1,635,000,000
PL 150 - 81st Congress, June 30, 1949	250,000,000	-	-	1,635,000,000
PL 434 - 81st Congress, October 29, 1949	-	-	250,000,000	1,635,000,000
PL 759 - 81st Congress, September 6, 1950	365,000,000	-	-	1,535,000,000
PL 759 - 81st Congress, September 6, 1950	240,000,000	-	-	1,535,000,000
PL 843 - 81st Congress, September 27, 1950	573,232,449 ^{e/}	125,000,000	-	1,660,000,000
PL 911 - 81st Congress, January 6, 1951	1,834,911,000	-	-	2,025,000,000
PL 253 - 82nd Congress, November 1, 1951	590,216,500	-	-	2,598,232,449
PL 253 - 82nd Congress, November 1, 1951	200,000,000	-	-	4,433,143,449
PL 455 - 82nd Congress, July 25, 1952	203,979,000	-	-	5,023,359,949
PL 176 - 83rd Congress, July 31, 1953	-	-	200,000,000	5,023,359,949
PL 428 - 83rd Congress, June 24, 1954	-	-	70,000,000	5,157,338,949
PL 663 - 83rd Congress, August 26, 1954	-	-	30,000,000	5,127,338,949
PL 112 - 84th Congress, June 30, 1955	379,952,000 ^{b/}	-	27,600,000	5,099,738,949
PL 112 - 84th Congress, June 30, 1955	321,721,000 ^{i/}	-	-	5,479,690,949
PL 112 - 84th Congress, June 30, 1955	27,400,000	-	-	5,801,411,949
Total PL 520	5,801,411,949 ^{i/}	1,020,000,000	27,400,000	5,801,411,949
TOTAL PL 117 AND PL 520	5,871,411,949 ^{i/}	1,020,000,000	1,020,000,000	5,871,411,949

^{a/} Congressional appropriations of funds for stockpiling purposes.^{b/} Congressional appropriations of contracting authority for stockpiling purposes in advance of appropriation of funds.^{c/} Congressional authorization to liquidate outstanding obligations incurred under previously granted advance contract authority.^{d/} Cumulative total of appropriated funds and advance contract authorization, less authorization to liquidate outstanding advance contracts.^{e/} Excludes \$8,845,792 received from sale of stockpile materials for wartime consumption. Receipts were returned to Treasury, February 1948.^{f/} Cancellation of previously authorized authority to make contracts.^{g/} Excludes \$25,404,921 transferred to operating expenses for rehabilitation of Government-owned material producing plants.^{h/} Excludes \$48,000 transferred to Transportation and Public Utilities Service, GSA.^{i/} Excludes \$430,000 transferred to Transportation and Public Utilities Service, GSA and \$199,349,000 transferred to General Fund Receipts on June 27, 1956 - PL 623 - 84th Congress.^{j/} Excludes receipts from rotational sales.

Source: General Services Administration

Table 2 TOTAL OBLIGATIONS AND EXPENDITURES OF STOCKPILING FUNDS

CUMULATIVE AND BY FISCAL PERIOD, THROUGH JUNE 30, 1956

FISCAL PERIOD	OBLIGATIONS INCURRED ^{a/}		EXPENDITURES ^{b/}	
	NET CHANGE BY FISCAL PERIOD	CUMULATIVE AS OF END OF PERIOD	BY FISCAL PERIOD	CUMULATIVE AS OF END OF PERIOD
Prior to Fiscal Year 1947	\$ 54,983,152	\$ 54,983,152	\$ 54,970,732	\$ 54,970,732
Fiscal Year 1947	68,888,533	123,871,685	11,359,999	66,330,731
Fiscal Year 1948	252,901,411	376,773,096	82,907,575	149,238,306
Fiscal Year 1949	459,766,881	836,539,977	304,486,177	453,724,483
Fiscal Year 1950	680,427,821	1,516,967,698	440,834,970	894,559,453
Fiscal Year 1951	2,075,317,099	3,592,284,897	655,537,199	1,550,096,652
Fiscal Year 1952	948,117,547	4,540,402,444	844,683,459	2,394,780,111
Fiscal Year 1953	252,375,163	4,792,777,607	906,158,850	3,300,938,961
Fiscal Year 1954	116,586,681	4,909,364,288	644,760,321	3,945,699,282
Fiscal Year 1955	321,799,833	5,231,164,121	801,310,094	4,747,009,376
Fiscal Year 1956 ^{c/}	251,692,667	5,482,856,788	382,011,786 ^{c/}	5,129,021,162 ^{c/}

^{a/} Figures are the sum of obligations incurred under PL 520, 79th Congress and PL 117, 76th Congress. Final obligations under PL 117, 76th Congress were incurred in Fiscal Year 1949.

^{b/} Figures are the sum of expenditures under PL 520, 79th Congress and PL 117, 76th Congress. Final expenditures under PL 117, 76th Congress were made in Fiscal Year 1951.

^{c/} 1956 fiscal period and cumulative expenditures are reported on an accrual basis.

Table EXPENDITURES OF STOCKPILING FUNDS, BY TYPE

CUMULATIVE AND FOR FISCAL YEAR 1956

SOURCE OF FUNDS AND TYPE OF EXPENDITURE	CUMULATIVE THROUGH JUNE 1955	FISCAL YEAR 1956	CUMULATIVE THROUGH ^{a/} JUNE 30, 1956
Expenditures			
Gross Total	\$5,068,430,764	\$465,214,583	\$5,533,645,347
Less: Adjustment for Receipts from Rotation Sales	321,421,388	83,202,797	404,624,185
Net Total	4,747,009,376	382,011,786	5,129,021,162
Material Acquisition Costs, Total	4,477,964,803	339,449,754	4,837,414,557
Material Purchases	4,315,401,022	348,642,063	4,664,043,085
Accessorial Costs	162,563,781	10,807,691	173,371,472
Stockpile Maintenance Costs, Total	242,269,310	18,781,503	261,050,813
Facility Construction	44,056,909	128,895*	43,928,014
Care, Handling and Processing of Transferred Materials	61,798,794	2,468,207	64,267,001
Other Storage and Handling Charges	110,630,367	15,333,528	125,963,895
Research and Experimental Work	19,472	19,747	19,747
Net Rotation Costs	25,763,768	1,108,388	26,872,156
Administrative Costs, Total	26,775,263	3,780,529	30,555,792
Emergency Procurement Service	26,393,758	3,757,573	30,151,331
Other	381,505	22,956	404,461

^{a/} Cumulative figures are the total of expenditures under PL 117, 76th Congress and PL 520, 79th Congress. Expenditures under PL 117, 76th Congress totaled \$70,000,000, of which \$55,625,237 was for materials acquisition costs and \$14,374,763 was for other costs. Final expenditures under PL 117 were made in FY 1951.

* Decrease

Source: General Services Administration

APPENDIX B

LIST OF STOCKPILE MATERIALS

SEPTEMBER 20, 1956

The materials listed below are currently included in the stockpiling program.
Not all of the materials are under active procurement.

GROUP I MATERIALS

The materials listed in this section constitute Group I and have been or may be acquired through purchase pursuant to Section 3(a) and by transfer of Government owned surpluses pursuant to Section 6(a) of Public Law 520, 79th Congress.

- | | |
|---|---|
| 1. Abrasives, Crude Aluminum Oxide | 38. Manganese, Battery Grade, Synthetic Dioxide |
| 2. Agar | 39. Manganese, Chemical Grade, Type A Ore |
| 3. Aluminum | 40. Manganese, Chemical Grade, Type B Ore |
| 4. Antimony | 41. Manganese Ore, Metallurgical Grade |
| 5. Asbestos, Amosite | 42. Mercury |
| 6. Asbestos, Chrysotile | 43. Mica, Muscovite Block,
Stained A/B and Better |
| 7. Asbestos, Crocidolite | 44. Mica, Muscovite Film,
First and Second Qualities |
| 8. Bauxite, Metal Grade | 45. Mica, Muscovite Splittings |
| 9. Bauxite, Refractory Grade | 46. Mica, Phlogopite Splittings |
| 10. Beryl | 47. Molybdenum |
| 11. Bismuth | 48. Nickel |
| 12. Cadmium | 49. Opium |
| 13. Castor Oil | 50. Palm Oil |
| 14. Celestite | 51. Platinum Group Metals, Iridium |
| 15. Chromite, Chemical Grade | 52. Platinum Group Metals, Palladium |
| 16. Chromite, Metallurgical Grade | 53. Platinum Group Metals, Platinum |
| 17. Chromite, Refractory Grade | 54. Pyrethrum |
| 18. Cobalt | 55. Quartz Crystals |
| 19. Coconut Oil | 56. Quinidine |
| 20. Columbite | 57. Rare Earths |
| 21. Copper | 58. Rubber, Crude Natural |
| 22. Cordage Fibers, Abaca | 59. Selenium |
| 23. Cordage Fibers, Sisal | 60. Shellac |
| 24. Cotton, Extra Long Staple | 61. Silicon Carbide, Crude |
| 25. Diamonds, Industrial, Bort and Stones | 62. Silk, Raw |
| 26. Feathers and Down, Waterfowl | 63. Silk Waste and Noils |
| 27. Fluorspar, Acid Grade | 64. Sperm Oil |
| 28. Fluorspar, Metallurgical Grade | 65. Talc, Steatite, Block |
| 29. Graphite, Ceylon - Crystalline and Amorphous | 66. Tantalite |
| 30. Graphite, Madagascar - Crystalline Flake and Fines | 67. Tin |
| 31. Graphite, other than Ceylon and Madagascar -
Crystalline | 68. Titanium Sponge |
| 32. Hyoscine | 69. Tungsten |
| 33. Iodine | 70. Vanadium |
| 34. Jewel Bearings | 71. Vegetable Tannin Extract, Chestnut |
| 35. Lead | 72. Vegetable Tannin Extract, Quebracho |
| 36. Magnesium | 73. Vegetable Tannin Extract, Wattle |
| 37. Manganese, Battery Grade, Natural Ore | 74. Zinc |

GROUP II MATERIALS

The materials listed in this section have been acquired principally through transfer of Government-owned surpluses pursuant to Section 6(a) of Public Law 520, 79th Congress, and constitute Group II. None is under procurement.

- | | |
|--|--------------------------------|
| 1. Bauxite, Abrasive | 8. Rutile |
| 2. Corundum | 9. Sapphire and Ruby |
| 3. Cryolite, Natural | 10. Talc, Steatite, Ground |
| 4. Diamond Dies | 11. Wool |
| 5. Mica, Muscovite Block, Stained B
and Lower | 12. Zirconium Ore, Baddeleyite |
| 6. Mica, Phlogopite Block | 13. Zirconium Ore, Zircon |
| 7. Optical Glass | |

APPENDIX C

REPORTS ISSUED BY THE DEPARTMENT OF THE INTERIOR, JANUARY-JUNE 1956

BUREAU OF MINES

Reports of Investigations

- 5158 Synthetic mica investigations: VII. Chemical analysis and calculation to unit formula of fluorsilicates.
- 5172 Concentration tests of California chromite ores.
- 5173 Manganese exploration in the Philipsburg district, Granite County, Montana.
- 5175 Experimental production of high-purity cobalt.
- 5178 Arc-welding titanium.
- 5179 Fabrication of titanium prototypes of 81-mm. Mortar base plate.
- 5181 Oxidation rates of molten metals as determined by a recording thermobalance: Part I, Tin.
- 5187 Preliminary investigation of the Takilma-Waldo Copper District, Josephine County, Oregon.
- 5188 Investigation of Tombstone District manganese deposits, Cochise County, Arizona.
- 5189 Galvanic corrosion properties of titanium in Organic Acids.
- 5190 Laboratory recovery of germanium and cadmium in sphalerite concentrates.
- 5193 Heat and free-energy data for tricalcium dititanate, sphene, lithium metatitanate, and zinc-titanium spinel.
- 5201 Galvanic corrosion properties of titanium and zirconium in various inorganic solutions.
- 5205 Electrolytic recovery of zinc from galvanizers' sal skimmings.
- 5206 Manganese resources of the Batesville District, Arkansas—Interim Report I.
- 5209 The Three Kids Manganese Deposit, Clark County, Nevada: Exploration, Mining, and Processing.
- 5210 Recovering lead and tin from wet solder drosses.
- 5213 Effect of temperature on the electrostatic separation of minerals.
- 5214 Zirconium purification, using a basic sulfate precipitation.
- 5217 Tulare County tungsten mines, California.
- 5218 Exploration for lead and zinc at the Madonna Mine, Monarch Mining District, Chaffee County, Colorado.

Information Circulars

- 7731 Tungsten potential in the San Juan area, Ouray, San Juan and San Miguel Counties, Colorado.
- 7740 Reconnaissance of the "Red Bed" Copper Deposits in Southwestern Colorado and New Mexico.
- 7743 Mining Methods and Costs at the Morning Mine, American Smelting & Refining Company, Shoshone County, Idaho. (Lead, silver, zinc.)
- 7745 Chrysotile-asbestos deposits of Arizona (supplement to Information Circular 7706).
- 7748 Tungsten potential in Chaffee, Fremont, Gunnison, Lake, Larimer, Park, and Summit Counties, Colorado.

Bulletins

- 556 Mineral Facts and Problems by the Staff of the Bureau of Mines, 1042 pp. 47 figs.
- 561 Zirconium: Its production and properties, prepared by Staff of Northwest Electrodevelopment Laboratory, Albany, Oregon. 180 pp. 138 figs.

U. S. GEOLOGICAL SURVEY

- Professional Paper 273, Geology and mineral deposits of the Boleo copper district, Baja California, Mexico. (Copper, cobalt, nickel, manganese, lead, zinc).
- Professional Paper 277, Stratigraphy of the Mascot-Jefferson City zinc district, Tennessee.
- Professional Paper 278, Geology and ore deposits of the Bagdad area, Yavapai County, Arizona. (Copper, lead, zinc, gold, silver, tungsten)
- Bulletin 975-D, Geology of south-central Oriente, Cuba. (Manganese)
- Bulletin 975-E, Geology and ore deposits of the Atacocha district, Departamento de Pasco, Peru. (Manganese)
- Bulletin 1009-K, Uranium-bearing nickel-cobalt-native silver deposits, Black Hawk district, Grant County, New Mexico.
- Bulletin 1027-B, Geology of the Crazy Woman Creek area, Johnson County, Wyoming. (Manganese)
- Bulletin 1027-E, Sugar Loaf and St. Kevin Mining districts, Lake County, Colorado. (Silver, lead, zinc, gold)
- Bulletin 1027-F, Copper deposits of the Helvetia mining district, Pima County, Arizona.
- Bulletin 1027-H, Geology of the Christmas Copper Mine, Gila County, Arizona.
- Bulletin 1027-K, Exploratory drilling for evidence of zinc and lead ore in Dubuque, Iowa.
- Bulletin 1027-P, Geology of the Murray district, Shoshone County, Idaho. (Lead, zinc)
- Bulletin 1036-F, A spectrographic method for determining the hafnium-zirconium ratio in zircon.
- Published Geologic Quadrangle Maps
 - Map GQ 71 Davis Mesa, Colorado. (Vanadium)
 - Map GQ 77 Anderson Mesa, Colorado. (Vanadium)
 - Map GQ 81 Juanita Arch, Colorado. (Copper, vanadium)
 - Map GQ 83 Rock Creek quadrangle, Colorado. (Copper, vanadium)
- Published Mineral Investigations Field Studies Maps
 - Map MF 37 Geologic and radiometric maps of the McKinley Mountain area, Wet Mountains, Colorado. (Thorium and rare earths)
 - Map MF 43 Geologic map of the Chassell quadrangle, Michigan. (Copper)
 - Map MF 45 Preliminary geologic map of the Allens Ranch quadrangle, Utah. (Silver, lead, zinc)
 - Map MF 46 Geologic map of the Hancock quadrangle, Michigan. (Copper)
 - Map MF 47 Geologic map of the Laurium quadrangle, Michigan. (Copper)
 - Map MF 48 Geologic map of the South Range quadrangle, Michigan. (Copper)
 - Map MF 53 Map of bedrock geology of Magnet Cove igneous area, Hot Spring County, Arkansas. (Columbium and titanium)
- Maps and Reports placed on open file for public inspection
 - Blue Ledge mine, Siskiyou County, California. (Copper, zinc, pyrite)
 - Bully Hill mine, Shasta County, California. (Copper, zinc)
 - Geology and ore deposits of the Whitepine area, Tomichi mining district, Gunnison County, Colorado. (Lead, zinc)
 - Geologic map of the Leadpoint quadrangle, Washington. (Lead, zinc, silver)
 - Drilling data in the Montfort, Rewey, Mifflin, Belmont, and Calamine quadrangles, Wisconsin zinc-lead district.
 - U. S. Geological Survey Exploration Program in the Trixie area, East Tintic mining district, Utah County, Utah. (Copper, lead, zinc)
 - The Central mining district, Grant County, New Mexico. (Manganese and vanadium)
 - Oxidation potential and state of some vanadium ores and the relation of woody material to their deposition.

